

Caseins and caseinates —

Part 10: Method for determination of fat (gravimetric reference method)

NOTE This Part should be read in conjunction with Part 1 “*General introduction, including preparation of laboratory samples*”, published separately.

UDC 637.142.2.04:[543.21:547.915]

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Dairying Standards Committee (DAC/-) to Technical Committee DAC/3, upon which the following bodies were represented:

- AFRC Institute of Food Research (Reading Laboratory)
- Association of British Preserved Milk Manufacturers
- Association of Public Analysts
- Association of Public Analysts of Scotland
- Creamery Proprietors' Association
- Dairy Trade Federation
- Department of Trade and Industry (Laboratory of the Government Chemist)
- Ice Cream Alliance Limited
- Intervention Board for Agricultural Produce
- Joint Committee of the Milk Marketing Board and the Dairy Trade Federation
- Milk Marketing Board
- Milk Marketing Board for Northern Ireland
- Ministry of Agriculture, Fisheries and Food
- Royal Association of British Dairy Farmers
- Royal Society of Chemistry
- Society of Chemical Industry
- Society of Dairy Technology
- University of Reading

This British Standard, having been prepared under the direction of the Dairying Standards Committee, was published under the authority of the Board of BSI and comes into effect on 31 December 1986

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The following BSI references relate to the work on this standard:
Committee reference DAC/3
Draft for comment 76/53486 DC

ISBN 0 580 15580 3

Amendments issued since publication

Amd. No.	Date of issue	Comments
5868	July 1988	Indicated by a sideline in the margin

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National foreword

This Part of BS 6248, which has been prepared under the Dairying Standards Committee, is identical with ISO 5543:1986 “*Caseins and caseinates — Determination of fat content — Gravimetric method (Reference method)*”, prepared by ISO/TC 34, Agricultural food products, of the International Organization for Standardization (ISO) in cooperation with the International Dairy Federations (IDF) and the Association of Official Analytical Chemists (AOAC).

This Part of BS 6248 supersedes clause 10 of BS 1416:1962 “*Methods for sampling and analysis of rennet casein*” and clause 11 of BS 1417:1963 “*Methods for the sampling and analysis of acid casein*”, which are deleted by amendment.

Terminology and conventions. The text of the International Standard has been approved as suitable for publication as a British Standard without deviation. Some terminology and certain conventions are not identical with those used in British Standards; attention is drawn especially to the following.

The comma has been used throughout as a decimal marker. In British Standards it is current practice to use a full point on the baseline as the decimal marker.

Wherever the words “International Standard” appear, referring to this standard, they should be read as “British Standard”.

The symbol “ml” has been used to denote millilitre. In British Standards it is current practice to use the symbol “mL”. In British Standards it is current practice to use the spelling “sulphur”, etc. instead of “sulfur”, etc.

Cross-references

International Standard	Corresponding British Standard
ISO 707:1985	BS 809:1985 <i>Methods for sampling of milk and milk products</i> (Identical)
ISO 3889:1977	BS 5522:1977 <i>Milk and milk products — Determination of fat content — Mojonnier-type fat extraction flasks</i> (Identical)
ISO 5550:1978	BS 6248 <i>Caseins and caseinates</i> Part 8:1982 <i>Method for determination of water content (reference method)</i> (Identical)

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 8, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

0 Introduction

This International Standard has been prepared within the framework of producing a series of methods, which are harmonized to the greatest possible extent, for the gravimetric determination of the fat content of milk, milk products and milk-based food.

A method based on the principle of Schmid-Bondzynski-Ratzlaff (SBR), involving digestion with hydrochloric acid, has been chosen, because:

- a) many caseins do not readily dissolve in ammonia, either because they contain or consist of hard lumps, or because they are not soluble, or are only poorly soluble, as such (for example rennet casein), and therefore cannot be examined according to the method based on the Röse-Gottlieb (RG) principle as used for milk and most milk products;
- b) all caseins and caseinates, due to their low lactose content [less than 5 % (*m/m*) of the dry matter], can be examined according to the SBR principle. This has the advantage over the Weibull method in that the method can be carried out using the same apparatus as that specified for the RG method and, at the same time, is less time consuming;
- c) methods based on the SBR principle have already found wide application in many countries as official or standardized methods for the examination of all caseins and caseinates.

1 Scope and field of application

This International Standard specifies the reference method for the determination of the fat content of all types of caseins and caseinates.

2 References

- ISO 707, *Milk and milk products — Methods of sampling*.
 ISO 3889, *Milk and milk products — Determination of fat content — Mojonnier-type fat extraction flasks*.
 ISO 5550, *Caseins and caseinates — Determination of water content (Reference method)*.

3 Definition

fat content of caseins and caseinates

all the substances determined by the method specified in this International Standard
 it is expressed as a percentage by mass

4 Principle

Digestion of a test portion with hydrochloric acid, addition of ethanol and subsequent extraction of the acid-ethanolic solution with diethyl ether and light petroleum, removal of the solvents by distillation or evaporation, and determination of the mass of the substances extracted which are soluble in light petroleum. (This is usually known as the Schmid-Bondzynski-Ratzlaff principle.)

5 Reagents

All reagents shall be of recognized analytical grade and shall leave no appreciable residue when the determination is carried out by the method specified. The water used shall be distilled water or water of at least equivalent purity.

To test the quality of the reagents, carry out a blank test as specified in 8.3. Use an empty fat-collecting vessel, prepared as specified in 8.4, for mass control purposes (see 10.1). The reagents shall leave no residue greater than 0,5 mg.

If the residue of the complete reagent blank test is greater than 0,5 mg, determine the residue of the solvents separately by distilling 100 ml of the diethyl ether and light petroleum respectively. Use an empty control vessel to obtain the real mass of residue, which shall not exceed 0,5 mg.

Replace unsatisfactory reagents or solvents, or redistil solvents.

5.1 Hydrochloric acid solution, $\rho_{20} = 1,125$ g/ml. (See also note to 8.5.1.)

Dilute 675 ml of hydrochloric acid ($\rho_{20} = 1,18$ g/ml) to 1 000 ml with water.

5.2 Ethanol, or *ethanol denatured by methanol*, at least 94 % (V/V). (See 10.5.)

5.3 Diethyl ether, free from peroxides (see 10.3) and containing no or not more than 2 mg/kg of antioxidants and complying with the requirements for the blank test (see the introductory paragraphs to clause 5, and also 10.1 and 10.4).

5.4 Light petroleum, having any boiling range between 30 and 60 °C.

5.5 Mixed solvent, prepared shortly before use by mixing equal volumes of the diethyl ether (5.3) and the light petroleum (5.4).